

IN THE CLAIMS:

These claims will replace all prior versions of claims in the present application.

1. (Currently Amended) Device for measuring time-resolved volumetric flow processes ~~in particular of injection processes in internal combustion engines, comprising with~~ _____ a translatory volume difference sensor ~~comprising having~~ a piston arranged in a measuring chamber and a data acquisition device that senses ~~the~~ a displacement of the piston, _____ an evaluating unit connected to the ~~which data acquisition device is connected to an evaluation unit, and~~ _____ characterized in that a pressure sensor disposed (14) is arranged in the measuring chamber and (4) in addition to the data acquisition device (6) sensing the displacement of the piston, which pressure sensor (14) is connected to the evaluating unit (12) such that by means of the measured values of the pressure sensor (14), a correction of ~~the~~ a flow amount ascertained from the measured values of the data acquisition device (6) takes place in the evaluating unit (12).
2. (Currently Amended) Device for measuring time-resolved volumetric flow processes ~~in particular of injection processes in internal combustion engines according to Claim 1, characterized in that a rotary displacer (8) is assigned to the wherein~~ _____ said translatory volume difference sensor (4, 5, 6) further comprises a rotary displacer, _____ ~~which the~~ displacer is driven via a motor (10) depending on ~~the~~ an adjacent volume difference, _____, whereby the said measuring chamber (4) is arranged disposed in an intake duct (3) that opens into an outlet duct behind, in the flow direction, the said translatory volume difference sensor (4, 5, 6) in the flow direction opens into an outlet duct (11), and _____ the rotary displacer (8) is arranged in a bypass line (7) to the translatory volume difference sensor (4, 5, 6), _____ whereby the rotary displacer (8) is controlled such that during one work cycle the speed of the displacer (8) is constant and essentially corresponds to the average flow over the entire work cycle.

3. (Currently Amended) Device for measuring time-resolved volumetric flow processes in particular of injection processes in internal combustion engines according to ~~one of Claims 1 or 2~~Claim 1, characterized in that ~~the~~wherein said data acquisition device ~~(6) is composed of~~comprises a sensor ~~whose produced to produce a voltage represents~~representing a measurement for ~~the said~~ displacement of ~~the said~~ piston ~~(5)~~ and that continuously senses the said displacement of ~~the said~~ piston ~~(5)~~ in the said measuring chamber ~~(4)~~.

4. (Currently Amended) Device for measuring time-resolved volumetric flow processes in particular of injection processes in internal combustion engines according to ~~one of the preceding claims~~Claim 1, characterized in that ~~the~~wherein said piston ~~(5)~~ has ~~the a~~ same specific weight the same as that of ~~as the a~~ fluid to be measured.

5. (Currently Amended) Device for measuring time-resolved volumetric flow processes in particular of injection processes in internal combustion engines according to ~~one of the preceding claims~~Claim 1, characterized in that further comprising a temperature sensor ~~(15) is arranged disposed in the said measuring chamber (4), which sensor is and~~ connected to the said evaluating unit ~~(12)~~.

6. (Currently Amended) Device for measuring time-resolved volumetric flow processes in particular of injection processes in internal combustion engines according to ~~one of the preceding claims~~Claim 1, characterized in that ~~the sensor wherein said~~ translatory volume difference sensor (6) is comprises a sensor selected from the group consisting of an optical sensor, an inductive sensor, or and a sensor that works on the an eddy current principle.

7. (Currently Amended) Device for measuring time-resolved volumetric flow processes in particular of injection processes in internal combustion engines according to ~~one of the preceding claims~~Claim 2, characterized in that ~~the~~wherein said rotary displacer ~~(8) is embodied as~~comprises a gear pump.

8. (Currently Amended) Device for measuring time-resolved volumetric flow processes in particular of injection processes in internal combustion engines according to ~~one of the preceding claims~~Claim 2, characterized in that ~~the~~ wherein said motor ~~is embodied as~~comprises a servo motor ~~(10) and has~~having a movement sensor ~~(13) connected to the said~~ evaluating unit ~~(12) and to an electronic control unit (16), whereby the a~~ signal of the

movement sensor-(13) represents a measurement for ~~the~~ a speed of ~~the~~ said rotary displacer (8).

9. (Currently Amended) Device for measuring time-resolved volumetric flow processes ~~in particular of injection processes in internal combustion engines according to Claim 8,~~ characterized in that ~~the~~ wherein said movement sensor-(13) is ~~embodied as~~ comprises a pulse generator disk.

10. (Currently Amended) Device for measuring time-resolved volumetric flow processes ~~in particular of injection processes in internal combustion engines according to one of the preceding claims~~ Claim 2, characterized in that ~~the~~ wherein a hydraulic length from a fuel injection valve-(1) to ~~the~~ an intake side of ~~the~~ said rotary displacer-(8) is equal to ~~the~~ a hydraulic length to ~~the~~ an outlet side of the rotary displacer-(8).

11. (Currently Amended) Device for measuring time-resolved volumetric flow processes ~~in particular of injection processes in internal combustion engines according to one of the preceding claims~~ Claim 1, characterized in that ~~the~~ measuring device (2) wherein the device for measuring is arranged connected between at least one fuel injection valve-(1) and a delay time tube.

12. (New) Device for measuring time-resolved volumetric flow processes of injection processes in internal combustion engines according to Claim 2 wherein said data acquisition device comprises a sensor to produce a voltage representing a measurement for said displacement of said piston and that continuously senses said displacement of said piston in said measuring chamber.

13. (New) Device for measuring time-resolved volumetric flow processes of injection processes in internal combustion engines according to Claim 2, wherein said piston has a specific weight the same as that of a fluid to be measured.

14. (New) Device for measuring time-resolved volumetric flow processes of injection processes in internal combustion engines according to Claim 2, further comprising a temperature sensor disposed in said measuring chamber and connected to said evaluating unit.

15. (New) Device for measuring time-resolved volumetric flow processes of injection processes in internal combustion engines according to Claim 2, wherein said translatory volume difference sensor comprises a sensor selected from the group consisting of an optical sensor, an inductive sensor, and a sensor that works on an eddy current principle.